Definition:

- There is no single definition of ‘Pediatric Environmental Health’. As commonly used, it refers to the impact of exposure to chemical contaminants on health and development from conception through adolescence.
- However, the scope of this field has expanded to include the influence of our human-made or ‘built’ environments and social environments, alone or in interaction with chemical exposures.
- As a medical specialty, ‘Pediatric Environmental Health’ is now recognized as an important adjunct to regular well child care.
- More than ever before, pediatric and public health practitioners recognize the special vulnerabilities of the developing fetus and child to environmental influences and are focused on the means of preventing and treating disease related to a wide variety of exposures.
‘Pediatric Environmental Health’ as clinical and public health disciplines refers to the Diagnosis, Treatment, and Prevention due to exposure to environmental hazards and the promotion of healthy environments for pregnant women and children.

**Course Objectives:**

- Understand how the fetus, infant and child are behaviorally and physiologically different from adults where environmental hazards and their impact on health and development are concerned.
- Understand the role of biomarkers of exposure, dose, and effect in pediatric environmental health research and clinical practice.
- Understand the origins and evolution of pediatric environmental health as a scientific and clinical discipline.
- Understand the public health aspects of pediatric environmental health as it relates to risk assessment, patient management, communication and advocacy.
- Understand the basic principles of human development as they relate to environmental chemical exposures and how early exposures may lead to higher risks for adult disease, including metabolic disorders, cancer, neurologic diseases, and other outcomes.
- Understand the scope of pediatric environmental health research and clinical practice on a global level.
- Understand the principles and methods of neuropsychological, psychometric, and neuroimaging assessment in pediatric environmental health studies.
- Understand the associations between environmental chemical exposures on neurodevelopment and diseases of the central nervous system, including cancer.
- Understand the relationship between air pollution and children’s pulmonary and related health outcomes.
- Understand the potential roles of the genome and epigenome in modifying risks associated with exposure to environmental toxicants.
- Understand how pediatric environmental health research findings can be translated into clinical and public health practice.
- Understand the ethical and logistical challenges of conducting pediatric environmental health research and clinical practice.
- Develop the knowledge and understanding to present your own views on a focused topic in pediatric environmental health to a student and faculty audience through a well organized platform presentation.

**Course Requirements:**

Class attendance, participation, and assigned readings, including online instruction will be required. Active participation in class discussions is highly encouraged. The final grade will be based upon participation (5%) student presentation (25%), and take-home mid-term examination (35%) and final examination (35%).
The student presentation (25% of grade) will take the form of a *platform power point presentation* of 20 minutes in length, and at least 5 minutes for class discussion. The student must also prepare a *power point outline and a bibliography of their primary literature sources for distribution to the class on the day of their presentation.* The presentation should be on a *focused organ, physiological system, or exposure specific* topic in pediatric environmental health. Please advise the course director of your topic no later than the 7th week of the spring semester.

The take-home mid-term and final examinations will be essay. The mid-term examination will be distributed by e-mail on February 20 and due on day of class February 27 12 PM EST. The final examination will be distributed on April 17 in class and will be due April 24, 12:00 PM EST.

**Course Format:**

Classes on most days will begin with a 15-30 minute discussion of the previous week’s readings. These readings will be e-mailed to you at least one week prior to lecture. Most of these articles are also readily available in the UCCM e-journals Donald C. Harrison Library online system. This period of the class is not optional. All students are expected to attend and participate. Questions and comments are welcome and expected. This will be followed by a lecture covering the week’s topic(s).

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**January 9**

1.) *Introduction to Pediatric Environmental Health*

Dr. Kim N. Dietrich

**Readings:**


Text: *Pediatric Environmental Health, 3rd Edition*, Preface, Chapters 1, 3, 4, Appendix A
January 16

1.) Group Discussion of Previous Weeks’s Readings

2.) Use and Interpretation of Biomarkers in Pediatric Environmental Health

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health, 3rd Edition*, Chapters 5, 6, 7, 8, 15, 16, 53

-January 23

1.) Group Discussion of Previous Week’s Readings

2.) Origins and Evolution of Children’s Environmental Health

Video Guest Lecture

Dr. Bruce P. Lanphear

Readings:


Text: *Pediatric Environmental Health, 3rd Edition*, Chapters 2, 57, 58, 59
January 30

1.) Group Discussion of Previous Week’s Readings

2.) Developmental Toxicology in Pediatric Environmental Health

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health, 3rd Edition, Chapter 44*

3.) Perinatal and Pediatric Origins of Adult Disease

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health 3rd Edition, Chapter 45*

February 6

1.) Discussion of Previous Week’s Readings

2.) International Pediatric Environmental Health:

A.) Contemporary Pediatric Environmental Health Disasters in Developing Countries

Dr. Kim N. Dietrich
B.) Challenges of Conducting Pediatric Environmental Health Studies Abroad

Guest Lecturer: Dr. Aimin Chen

Readings:

Centers for Disease Control (2010). Notes from the field: Outbreak of acute lead poisoning among children aged <5 years—Zamfara, Nigeria. MMWR, 59, 846.


Text: Pediatric Environmental Health, 3rd Edition, Chapters 12, 14, 17, 18, 31, 51, 52

February 13

1.) Discussion of Previous Week’s Readings

2.) Air Pollution and Children’s Health

Guest Lecturer: Dr. Patrick Ryan

Readings:


February 20

Mid-Term Examination week.

February 27

1.) Discussion of Previous Week’s Readings

2.) Assessment of the Central and Peripheral Nervous Systems in Pediatric Environmental Health

Lecturers: Drs. Kimberly Yolton and Kim Cecil

Readings:


March 6

1.) Discussion of Previous Week’s Readings

2.) Neurobehavioral and other Health Effects of Prenatal/Postnatal Exposure to Environmental Chemicals on the Central Nervous System - I

Dr. Kim N. Dietrich

Readings:


March 13

1.) Discussion of Previous Week’s Readings

2.) Neurobehavioral and other Health Effects of Prenatal/Postnatal Exposure to Environmental Chemicals on the Central Nervous System – II

Guest Lecturer: Dr. Tania Carreon-Valencia
Readings:


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March 20

Spring Break

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March 27

1.) Translating Pediatric Environmental Health Research into Clinical Practice.

Guest Lecturer: Dr. Nicholas Newman

Readings:


www.atsdr.cdc.gov/emes/training/index.html

This interactive, animated/audio, web-based module introduces the basics of pediatric environmental health practice. It offers health-care providers detailed examples about how to best deliver anticipatory guidance on a range of environmental health issues related to children’s health and development. Case examples explore the unique biological factors and exposure patterns that make children especially vulnerable to toxic chemicals. These should help pediatric health care specialists recognize possible environmental causes of some of the illnesses they might treat in their daily practice, as well as potential environmental exposures to be avoided. The module also discusses current pediatric medical practices related to environmental health and provides resources for delivering anticipatory guidance during well-child visits. The training module takes approximately 90 minutes to complete. CME credits are available.

April 3

Student Presentations I

April 10

Student Presentations II

April 17

1.) Student Presentations III (If Necessary)

2.) Review and Discussion of Topics Covered in Course

3.) Distribution of Final Examinations

Final Examination Week

Your final examinations are due Thursday, April 24 at 3:30 PM EST. You may deposit your examinations in my mailbox located in the Kettering Laboratory mailroom (Rm. 125) or e-mail to kim.dietrich@uc.edu.